

8/01970

GP-3-79

CITY OF FOSTER CITY, CALIFORNIA

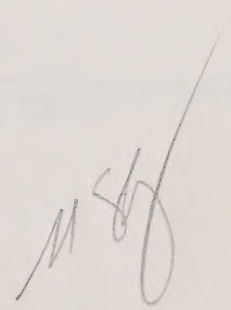
(PUBLIC) SAFETY ELEMENT OF THE GENERAL PLAN

INSTITUTE OF GOVERNMENTAL
STUDIES LIBRARY

OCT 15 1979

UNIVERSITY OF CALIFORNIA

Prepared by: Foster City Planning Department
July, 1979

A handwritten signature in dark ink, appearing to be 'MSB', is written over the bottom right corner of the page.

RESOLUTION NO. 79-98

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF FOSTER CITY ADOPTING THE SEISMIC SAFETY AND (PUBLIC) SAFETY ELEMENTS OF THE CITY OF FOSTER CITY GENERAL PLAN

CITY OF FOSTER CITY

BE IT RESOLVED BY THE CITY COUNCIL OF THE CITY OF FOSTER CITY, as follows:

WHEREAS, on August 2, 1979 the Planning Commission did by Resolution No. P-66-79 approve the Seismic Safety and (Public) Safety Elements as presented by the Planning Department Staff, finding said Elements to conform to the requirements of Article 5, Chapter 3 of Title VII, California Government Code, and the State Resources Agency Environmental Quality Act Guidelines Section 15148; and

WHEREAS, the Planning Commission did recommend that the City Council adopt said Elements, after consideration of the findings, policies and recommendations therein, as parts of the Foster City General Plan; and

WHEREAS, after due notice, the City Council did on September 4, 1979 open, hold and close a Public Hearing on these matters; and

WHEREAS, the City Council finds the content of the studies and the actions of the Planning Commission to be complete, correct and in satisfaction of applicable law.

NOW, THEREFORE, BE IT RESOLVED that the City Council of the City of Foster City hereby approves and adopts said Seismic Safety and (Public) Safety Elements as parts of the Foster City General Plan.

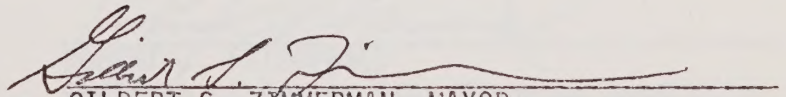
PASSED AND ADOPTED as a Resolution of the City Council of the City of Foster City at the Regular Meeting held on the 4th day of September, 1979, by the following vote:

AYES: Councilmen Chavez, Gilbert, Kruss, Matsuo, and Mayor Zimmerman

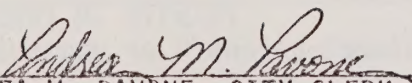
NOES: None

ABSENT: None

ABSTAIN: None


GILBERT S. ZIMMERMAN, MAYOR

ATTEST:


ANDREA M. PAVONE, CITY CLERK

RESOLUTION NO. P-66-79

A RESOLUTION OF THE PLANNING COMMISSION OF THE CITY OF FOSTER CITY -- TO AMEND THE FOSTER CITY GENERAL PLAN BY ADOPTION OF A SEISMIC SAFETY ELEMENT AND A (PUBLIC) SAFETY ELEMENT AS PARTS OF SAID GENERAL PLAN (GP-3-79)

CITY OF FOSTER CITY PLANNING COMMISSION

BE IT RESOLVED BY THE FOSTER CITY PLANNING COMMISSION, as follows:

WHEREAS, Article 5, Chapter 3 of Title VII, California Government Code, requires Cities and Counties to include Seismic Safety and (Public) Safety Elements as parts of their General Plans; and

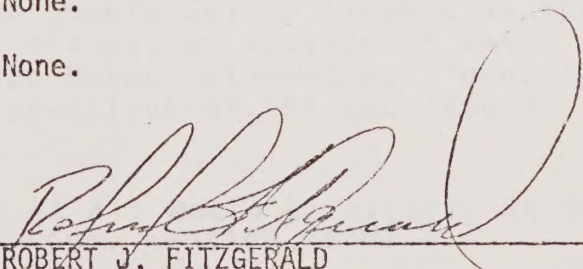
WHEREAS, the City of Foster City has conducted such studies and, after due notice, the Planning Commission did on August 2, 1979 open, hold and close a Public Hearing on these matters; and

WHEREAS, the Planning Commission finds the studies as presented by Staff to be complete and correct and in satisfaction of the requirements of State law, as to the Government Code and the State Resources Agency Environmental Quality Act Guidelines Section 15148.

NOW, THEREFORE, BE IT RESOLVED that the Planning Commission hereby approves the Seismic Safety and (Public) Safety Elements and recommends that the City Council adopt said Elements, after consideration of the findings, policies and recommendations therein, as parts of the Foster City General Plan.

Passed and adopted by the Planning Commission of the City of Foster City at a regular meeting thereof held on August 2, 1979 by the following vote:

AYES, COMMISSIONERS:	Broomhead, Chinn, Kundupoglu, Oliver, and Chairman Fitzgerald.
NOES, COMMISSIONERS:	None.
ABSENT, COMMISSIONERS:	None.
ABSTAIN, COMMISSIONERS:	None.




ROBERT J. FITZGERALD
Chairman of Foster City Planning Commission

ATTEST:



ROBERT M. STEWART
Secretary to Planning Commission



Digitized by the Internet Archive
in 2024 with funding from
State of California and California State Library

<https://archive.org/details/C124900900>

COMPLIANCE WITH CALIFORNIA ENVIRONMENTAL QUALITY ACT GUIDELINES -
SECTION - 15148

This document meets the requirements of the California Environmental Quality Act which allows for the waiver of a separate Environmental Impact Report if the following points have been addressed:

1. Description of the project, to be found in Sections 1100 - 2600.
2. Description of environmental setting -- Sections 3000 - 3220; Sections 3310 - 3330; Sections 3400 - 3420; Sections 3500 - 3520; Sections 4000 - 4140; Sections 4200 - 4220; Sections 5000 - 5220; Sections 6000 - 6122; Sections 6300 - 6310; Sections 6400 - 6440; Sections 6500 - 6530; Sections 8000 - 8120; Sections 8200 - 8210; Sections 8300 - 8312; Sections 9000 et seq.
3. Environmental impact -- Section 3230; Sections Section 3430; Sections 3530 - 3550; Section 4150; Sections 5230 - 5280; Sections 6123 - 6125; Sections 6130 - 6131; Sections 6200 - 6220; Sections 6320 - 6380; Sections 6450 - 6470; Section 6540; Sections 8130 - 8140; Section 8220; Section 8313; Section 8316
4. Mitigation measures -- Section 7000, et seq., Sections 8150; Section 8240; Sections 8314 - 8315; Section 8317, Section 8500, et seq.

ALTERNATIVES

The City of Foster City considered two alternatives to adoption of the (Public) Safety Element:

1. Adoption of the San Mateo County Safety Element -- for reasons explained in the mitigation section of this element, the County of San Mateo element was found to be too general in its discussions of the conditions peculiar to Foster City.
2. Provision of no elements at all would be clearly in violation of the Government Code, Section 65302.2.

A list of the persons contacted, including the bibliography reference, appears in the back of this document.

The adopted General Plan Element will be sent to the County of San Mateo and the following cities:

1. San Mateo
2. Belmont
3. Redwood City

A Notice of Determination will be issued on the adoption of this General Plan Element.

TABLE OF CONTENTS
FOSTER CITY (PUBLIC) SAFETY ELEMENT

	<u>PAGE NO.</u>
<u>SUMMARY</u>	1
1000. <u>INTRODUCTION</u>	3
1100. <u>Discussion of State Mandate and Government Code Section 65302.1</u>	3
2000. <u>TYPES OF NATURAL AND MAN-CAUSED HAZARDS</u>	3
2100. <u>Ground Shaking</u>	3
2200. <u>Soil Liquefaction</u>	4
2300. <u>Tsunamis and Seiches</u>	4
2400. <u>Fire Problems</u>	4
2500. <u>Emergency Service Demands</u>	4
2600. <u>Police Problems</u>	4
3000. <u>REVIEW OF SEISMIC HAZARDS</u>	5
3100. <u>Summary</u>	5
3200. <u>Ground Shaking</u>	5
3300. <u>Liquefaction</u>	6
3400. <u>Tsunamis</u>	6
3500. <u>Dam Failure</u>	8
4000. <u>REVIEW OF FIRE HAZARDS</u>	9
4100. <u>Man Induced Fires</u>	9
4200. <u>Impact of Vacant Lots in Foster City</u>	10
5000. <u>FLOODING HAZARDS</u>	12
5100. <u>The 100 Year Flood</u>	12
5200. <u>The Levee System and Possible Flooding</u>	13
6000. <u>IMPACT OF NATURAL DISASTERS ON KEY FACILITIES IN AND AROUND THE CITY OF FOSTER CITY</u>	14
6100. <u>Highways and Freeway Network</u>	14
6120. <u>San Mateo County</u>	15

	<u>PAGE NO.</u>
6130. <u>Foster City Situation</u>	16
6200. <u>Bridges</u>	16
6300. <u>Utilities: Power and Gas</u>	17
6400. <u>Utilities (Water)</u>	19
6500. <u>Effects of Flooding</u>	20
7000. <u>REVIEW OF EMERGENCY PLANS</u>	21
7100. <u>Nature of Disaster Preparedness</u>	21
7200. <u>Emergency Operating Center</u>	22
8000. <u>SAFETY FACTORS OF SPECIAL CONCERN TO FOSTER CITY</u>	23
8100. <u>Problem of Subsidence and Differential Settlement</u>	23
8200. <u>San Francisco International Airport</u>	24
8300. <u>Hazardous Materials</u>	25
8500. <u>Warning System and Impact on Foster City</u>	26
8600. <u>Emergency Broadcast System (EBS)</u>	28
8700. <u>San Mateo County Emergency Plan</u>	29
8800. <u>The City of Foster City and its Civil Defense Disaster Plan</u>	30
9000. <u>PUBLIC SAFETY</u>	30
9100. <u>Police Department</u>	30
9200. <u>Ambulance Service</u>	31
<u>RECOMMENDATIONS AND PROPOSED POLICY</u>	32
<u>BIBLIOGRAPHY</u>	34

SUMMARY

(PUBLIC) SAFETY ELEMENT FOSTER CITY GENERAL PLAN

The State Government Code Section 65302.1 requires all city and county general plans to contain a Safety Element: "... for the protection of the community from fires and geologic hazards including features necessary for such protection as evacuation routes, peak lod water supply requirements, minimum road widths, clearance around structures, and geologic hazard mapping in areas of known geologic hazard."

The objective of the element, as stated by guidelines prepared by the State Council on Intergovernmental Relations is "... to introduce safety considerations into the planning process in order to reduce loss of life, injuries, damage to property and economic and social dislocation...."

The Safety Element, accordingly, covers fire prevention and control, crime prevention, and provision of emergency services in the event of accidents, major fires and geological or seismic disasters. It also examines potentially hazardous land use relationships, land use and building regulations, and the planning aspects of the delivery of fire, police and emergency service.

Further, the Element examines the issue of ground shaking, associated hazards and their impacts on the city. Liquefaction and associated ground failure is also examined, looking specifically at underlying soils conditions and potential for liquefaction.

Water related seismic hazards reviewed in the document include the effect of tsunamis on Foster City. Also, inundation of Foster City from the failure of San Andreas and Crystal Springs dams and subsequent impacts are examined.

The impact of fire, both man-induced and natural, is examined. Fire Department staffing and response times are discussed and Fire Department fire prevention programs are also presented.

The 100 Year Flood probability and likely impact on the City is examined and mitigation measures are presented.

The Levee System of Foster City is also investigated. Consideration is specifically given to the criteria used to design the system and the mitigation factors used to improve the safety of the system.

The impact of natural disasters on key facilities in and around the City are discussed. Major attention is directed to the highway and freeway network and its possible disruption due to natural disasters.

The utilities network of the City, plus those of independent suppliers of utilities services (such as Pacific Gas and Electric and the San Francisco Water Department), is included in the Element.

The Police Department and the number of full-time police officers and police response time is focused on in the document and crime problem areas are also examined.

Ambulance service to the City, provided by Medevac and the Foster City Fire Department, is reviewed.

The final section of the Element involves discussion of the "Nature of Disaster Preparedness," the Emergency Broadcast System, the San Mateo County Emergency Plan and the City of Foster City's Civil Defense Disaster Plan.

1000. INTRODUCTION

1100. Discussion of State Mandate and Government Code Section 65302.1

1110. The State of California has mandated that all California cities and counties prepare additional elements to their respective general plans. The additional element discussed in this report is the (Public) Safety Element. This element deals with the natural and person-caused disasters which may pose a hazard to the residents of the City of Foster City. Planning for the elimination or mitigation of hazards can be partially accomplished through the general planning process, which is why these are considered proper elements of the general plan. Furthermore, evacuation and other disaster preparedness exercises are influenced by the physical layout and operations of the City.

1120. The Government Code Section 65302.1 requires all city and county general plans to contain a Safety Element: "...for the protection of the community from fires and geologic hazards including features necessary for such protection as evacuation routes, peak load water supply requirements, minimum road widths, clearance around structures, and geologic hazard mapping in areas of known geologic hazard."

1130. The objective of the element, as stated by guidelines prepared by the State Council on Intergovernmental Relations (CIR) is "...to introduce safety considerations into the planning process in order to reduce loss of life, injuries, damage to property and economic and social dislocation...."

1140. This report covers fire prevention and control, crime prevention, and provision of emergency services in the event of accidents, major fires and geological or seismic disasters. It examines potentially hazardous land use relationships, land use and building regulations, and the planning aspects of the delivery of fire, police and emergency services.

2000. TYPES OF NATURAL AND MAN-CAUSED HAZARDS

2100. Ground Shaking

2110. Most of the damage caused by earthquakes can be attributed to movement of the ground as earthquake waves pass through it. The nature of ground motion is strongly influenced by the type and thickness of underlying rock or soil. This means that buildings located on different earth materials may experience varying levels of damage as a result of earthquake shaking. Much of the structural damage caused by past earthquakes could have been avoided by proper attention to foundation

and building design.

2200. Soil Liquefaction

2210. Soil liquefaction results from a loss of soil strength during earthquake vibrations. Soil types that are most susceptible to liquefaction are clean, uniformly graded, loose, saturated, fine-grained sands. Factors most influencing liquefaction potential are degree of water saturation, density, and grain-size characteristics of the soil deposits. Slopes with a liquefaction potential are especially prone to failure.

2300. Tsunamis and Seiches

2310. Tsunamis are large ocean waves commonly caused by vertical faulting of the ocean floor. Such earthquake-associated waves (often erroneously called tidal waves) can cause considerable damage when they reach shallow coastal areas. Although Japan, Alaska, Hawaii, and California have all experienced damaging tsunamis in the past, the frequency of such waves is low.

2400. Fire Problems

2410. Fire problems are those types of fires where the frequency of occurrence or severity may be reduced by changes in the general plan and/or planning practices and regulations. These include fire risks associated with seismic activity (such as rupture of utility lines) which could be mitigated by changes in location or design.

2500. Emergency Service Demands

2510. Emergency service demands are for, and the capability of responding to, emergency situations of varying magnitude. These may be caused by moderate, major or great earthquakes, other geologic conditions, hazardous land uses or land-use relationships, and transportation of hazardous materials. Their severity may be mitigated in the future by changes in emergency procedures and by changes in the general plan and regulations. The ambulance service capabilities and service problems are included under emergency service demands.

2600. Police Problems

2610. Police problems upon which planning activities have a bearing include the difficulty of patrolling new developments, and traffic and circulation problems

which inhibit police activities and cause accidents. In addition, the design and layout of commercial and multiple structures seems to encourage certain types of crime.

3000. REVIEW OF SEISMIC HAZARDS

3100. Summary

3110. There are four earthquake associated hazards discussed below. More detailed discussion is available in the Foster City Seismic Safety Element.

3200. Ground Shaking

3210. The natural soil underlying Foster City is silty clay, averaging 40 feet in thickness, ranging from 25 feet to more than 100 feet. The original surface was mostly marshland, reclaimed prior to 1900 by diking around the perimeter of the site, thus precluding tidal action. The surface was then drained and dried out, forming a crust several feet thick. The soil conditions are thus quite uniform, except in locations where former ditches, dikes and sloughs traverse the site.

3220. Hydraulically placed fill consisting mostly of sand and shells was then added on top of the surface crust and compacted to a density capable of supporting building construction. The fill is fairly uniform, except as required for street and lot grading and drainage, and where surcharged over former ditches and sloughs (Nichols, C.L., June 10, 1963, letter to T. Jack Foster & Sons.)

3230. However, because of the subsurface conditions of the site, it is expected that relatively large amplitude, low frequency ground motion will occur during earthquakes. Consequently, underlying soil conditions and future potential large earthquakes should be recognized by the builders, their structural engineers, architects, designers, etc., in the design of foundation and super structures, although low (structures under 30 feet in height), lightweight, conventionally-framed structures located in Foster City do not appear to behave very differently under seismic loading than do similar structures

elsewhere in the San Francisco Bay area, tall structures founded on bay fill respond differently to seismic loading than do structures build on non-filled land. (A more detailed discussion of earthquake and associated ground shaking is given in the Foster City Seismic Element).

3300. Liquefaction

3310. During the course of Foster City's development, there have been questions raised concerning the potential for liquefaction of Bay Muds due to the occurrence of an earthquake.

3320. Subsurface data available for the Foster City area indicates the apparent absence of a potentially liquefiable, continuous sheet of sand and gravel within the Bay Mud deposits (Draft Seismic Safety/ Safety Element, 1975). In the 1976 Dames and Moore Seismic Safety Elements of the General Plan for San Mateo County, these consultants stated that "the Bay Muds" sediments in San Mateo County are composed almost exclusively of silty clay, but also contain occasional lenses of sand and silt (principally in the area of San Bruno Shoals). Work by consultants in the Redwood Shores area indicate little or no loss in strength during dynamic loading for silty clay samples of Bay Mud. According to these same consultants, no significant amounts of sand lenses within the Bay Muds were disclosed by the more than 250 borings made on the Redwood Shores. The results of dynamic triaxial analysis tests on samples of sand and gravel from strata beneath the Bay Mud in the Redwood Shores area indicate that these deeper lenses of granular sediments should remain relatively stable under seismic shaking. Moreover, the 1976 Dames and Moore Report goes on to state that "the characteristics of the Bay Mud and recent alluvium beneath Foster City may be similiar to these of the Redwood Shores area and hence may have similar low liquefaction" potential.

3330. Regardless, it must be reaffirmed that there is the potential for liquefaction, but it must be regarded as being of a very limited nature (see the Foster City Seismic Safety Element for a more detailed discussion of this subject).

3400. Tsunamis

3410. The San Mateo County Seismic and Safety Element states that according to Ritter and Dupre (1972) (Maps showing Areas of Potential Inundation by Tsunamis in the San Francisco Bay Region, California, United States

United States Geological Survey MF-480), ".... inundation of Foster City by tsunamis is possible, but highly unlikely". On the Geotechnical Hazard Synthesis Map nearly all of Foster City is indicated as subject to flood hazard from tsunamis.

3420. In the Foster City Seismic Safety Element, the issue of inundation by tsunamis was fully addressed. Essentially, the key points made in that element are that the assumptions made by Ritter and Dupre have been replaced by dramatic change in the levee situation, and in effect have necessitated a reexamination of the impact of tsunamis on Foster City. Moreover, there was reasonable evidence to conclude that a 20 foot tsunami striking Foster City was very unlikely. At Redwood Shores, the maximum tsunami would be 6 feet, not 20 feet as predicated by the findings of Ritter and Dupre.

3430. To place the possibility of a tsunami striking Foster City in proper perspective, Arthur M. Stout, at the time a member of the Foster City Planning Department, used the following logic to place in perspective the effect of a tsunami striking the City.

"The normal tide range, using Foster City datum, is 96.095 to 102.334 feet and the mean tide elevation is taken at 100 feet. The minimum height sections could be at or near overtopping, providing that the tsunami occurs at the time the tide exceeds 102 feet. The probability of occurrence of this event is approximately 1 in 423,000.

"The highest tide is 106.8 feet. The probability of this event occurring with the 6 foot tsunami wave is approximately 1 in 256,000. This is based on the estimate that the maximum duration of overtopping is 6.8 hours in a year of 8,760 hours with 200 years as the mean time between tsunamis. In other words, if a tsunami occurred every 200 years, or for that matter every year, there is only one chance in 1280 that it would happen at a time when the tide would permit overtopping the dike."

On June 8, 1976, Stout once again pointed out the amount of damage that might occur from a tsunami coming from the North Bay. In part he said that, assuming a five foot tidal wave in the Bay at Foster City on an estimated 200 year recurrence interval, overtopping of the North levee (crest elevation 109.8) could only occur if the tide elevation was in excess of 104.8. A tidal wave approaching Foster City from the North will

have its most server impact upon the North levee. A tidal wave will shear along the East levee (Crest elevation 109.9). However, the San Mateo-Hayward Bridge and the County Fishing Pier will dissipate much of the energy of the wave. Belmont Slough will experience some effect of the wave but because it is protected by the projection of Brewer's Island into the Bay, a five foot wave could not enter the Slough. No general inundation of Foster City would occur even if the tide elevation was in excess of 104.8 feet because only that amount of water in the wave crest above the top of the levee would produce minor flooding.

3500. Dam Failure

The 1976 San Mateo County Seismic Safety/Safety Element report, Volume 1 states that "Inundation of Foster City from the failure of San Andreas and Crystal Springs dams is a possibility, although remote." It is further stated "...since the dam inundation map used as the data base in this study is orientated toward emergency preparedness planning, without qualification as to depth, velocity of water, duration of inundation, or even the probability of such a maximum occurrence, planning considerations for such an event cannot reasonably be applied without more substantial study and data" (San Mateo County Seismic & Safety Element, 1976, p.23). The art and science of earthquake engineering for dams has progressed considerably in recent years.

3510. Since the new techniques available for analyzing the seismic stability of dams need further development, the San Francisco Water Department takes the position that the test of present methods analysis and past performance, including the fact that Lower Crystal Springs Dam withstood the 1906 Earthquake with no apparent damage and remains in good condition, is sufficient to make a reasonable judgement as to its adequate safety.

3520. A sophisticated method for determining the seismic stability of earth fill dams using a new procedure including dynamic analysis has recently been developed. While this method is relatively new and the input information is generally limited, it is considered to be the best method available for analyzing the dynamic stability of earth fill dams. This method will undoubtedly be improved upon as more information becomes available. Currently, both San Andreas and Lower Crystal Springs Dams are considered to have an adequate margin of safety and are currently certified for full use based on periodic inspection and review of surveillance data (Dukleth, G.W., letter of August 4, 1974, to James F.

Halcomb, Superintendent, Hillsborough City District, Hillsborough, California).

3530. In September of 1978, Dames and Moore made a progress report to the City of Foster City's Planning Department regarding the possibility of failure of the Crystal Springs and San Andreas Dams. As far as Dames and Moore could determine in September of 1978, no work has been done to calculate the quantity of water which would be expected to flow over the dikes protecting Foster City. A model of the hypothetical flow patterns from a break in the Crystal Springs and San Andreas Dam could be developed. The process of doing so, however, would be costly and would take considerable time (Nichols, C. L., letter to Milton Nicholas, Planning Director, Foster City, September 22, 1978).

3540. However, in a report from the City of Foster City, titled "Comments On: Specific Issues for the City of Foster City", the Public Works Department of Foster City offers an insight into the extent of flooding in Foster City. The attitude of the Public Works Department is as follows: "There exists an area within the City of San Mateo east of the El Camino Real of the approximate size of Foster City which lies four to six feet below the crest elevation of the levee along Marina Lagoon in Foster City. Should Crystal Springs Dam fail and flood San Mateo, the height of the flooding would have to be in excess of six feet adjacent to Marina Lagoon. It is anticipated that the maximum depth of flood inundation at the County Fair Grounds, approximately one mile west of Foster City, would be about two feet. It is, therefore, highly improbable that failure of the Crystal Springs Dam will produce any flooding in Foster City."

3550. For a more detailed discussion of potential dam failure affecting Foster City, consult the City of Foster City Seismic Safety Element.

4000. REVIEW OF FIRE HAZARDS

4100. Man Induced Fires

4110. Currently there is one fire station in use in Foster City, located at 1040 East Hillside Boulevard. There is a proposal for a second fire station to be constructed in Neighborhood 8A when it is developed. Presently, the Fire Department has 23 full-time fire fighters, divided into two 7 men shifts and one 8 man

shift. In addition to these 23 paid employees there are a total 23 volunteer fire fighters. Based on the 23 full-time fire fighters and a population of 26,000, Foster City has .88 fire fighters per 1,000 of the population.

4120. The Foster City Fire Department currently has 3 fire engines and 1 fire truck. Each of these vehicles have water pumping capabilities.

4130. Foster City has instituted a full-scale fire prevention program to reduce the occurrence of fire in the City. The program involves yearly inspection of all commercial buildings. In addition to the yearly inspection of commercial structures, the Fire Department examines each home in Foster City once every three years. Public assemblies are also checked by the Fire Department for fire violations.

4140. The response time for the Foster City Fire Department ranges from 3 to 5 minutes, depending on the nature of traffic and location of the fire. With various shift schedules, vacation schedules, sick leave and limited amount of equipment, Foster City can only respond to one fire at a time. As a mitigating measure, Foster City has made arrangements with the cities of Belmont and San Mateo for emergency fire assistance. Response time for the San Mateo Fire Department, located near the intersection of Highway 92 and Norfolk Avenue, is 6 minutes to any point in Foster City.

4150. It is projected that as Foster City increases in size in the next five years, together with the additional vehicular traffic at peak rush hours, response time will be increased. To mitigate this projected safety hazard, the fire Department has proposed an additional fire station be constructed in Neighborhood 8A when construction is completed there.

4200. Impact of Vacant Lots in Foster City

4210. There are several vacant lots in Foster City that because of the annual growth of native and non-native vegetation, presents a potential fire hazard to the City. When Foster City is fully developed this problem will be eliminated. However, to mitigate this current hazard, the Fire Department has developed a program, where it is feasible, to cut 8 foot fire breaks along the edges of sidewalks, extending into the body of the grass fields.

4220. Table 1 gives a summary of the nature and extent of the Fire Department's activities, based on calls for the years 1977 and 1978. It should be noted that the Table is all inclusive, denoting not only actual fire calls, but also other types of emergency related activities.

TABLE 1
FIRE DEPARTMENT RESPONSES FOR 1977 & 1978

<u>TYPE OF CALLS</u>	<u>NO. OF CALLS</u>	<u>% OF CALLS</u>	<u>NO. OF CALLS</u>	<u>% OF CALLS</u>	<u>% OF INCREASE OVER 1977</u>
FIRE CALLS	159	20.7	218	23.8	+ 59
HAZARDOUS	35	4.6	37	4.0	+ 2
SPIILLS/LEAKS	-	-	-	-	-
NON-EMERGENCY	59	7.7	79	8.6	+ 20
ASSISTS	-	-	-	-	-
FALSE/NEEDLESS	146	19.0	177	19.3	+ 31
HONEST MISTAKES	-	-	-	-	-
RESCUE	33	4.3	51	5.6	+ 18
INJURY AND BREATHING	335	43.7	353	39.6	- 19
TOTALS	767	100.0	915	100.0	+ 148

5000. FLOODING HAZARDS

5100. The 100 Year Flood

5110. The Federal Government has examined the issue of flooding within the political boundaries of Foster City. The concern of the Federal Government was directed towards the issue of the 100-year flood. The Department of Housing and Urban Development (HUD) was the lead agency in this review process. Their potential areas of flooding is the result of an Act passed by Congress in 1968 entitled the Federal Flood Insurance Program. The Act for the first time allowed property owners to get flood insurance who up to that time were unable to get coverage through private industry. In return for the Federal subsidy, State and local governments are required to adopt certain minimum land use measures to reduce or avoid future flood damage within the flood-prone area.

5120. Turning to the flood maps, the first map denoting the flood-prone areas of the San Francisco Bay Area was compiled by J. T. Limerinas, K. W. Lee and P. E. Lugo in 1973. The map is titled Flood Prone Areas in the San Francisco Bay Region, California (the map was based on the United States Geological Survey's San Francisco Bay Region, Sheet 3 of 1:125,000, 1970). It should be noted that this map delimited Foster City as an area that would not be flooded. In 1974, HUD presented its first map outlining the possible boundaries of a flood-prone area outside and within the Foster City area (FIA Flood Hazard Boundary Map, June 14, 1974). This map is based on the 100-year flood having a one percent or greater chance of occurrence in any given year, Hunter, letter of December 16, 1976). The map places specific flood hazards outside the actual physical boundaries of Foster City, that is, outside the levee system. Thus, the flood-prone area of Foster City is the area North and East of the levee system and Belmont Slough.

5130. In the most recent National Flood Insurance Map, dated January 1, 1977, Foster City has been demarked into two zones, based on degree of flood hazard for the City. The two zones significant to this analysis are Zone A (an area of special flood hazard) and Zone C (an area of minimal flood hazard). The areas of major concern in respect to Zone A for Foster City are North and East of the levee system surrounding the City and the area of Belmont Slough. From the January 1, 1977 map, areas that would be subject to Zone A flooding includes a portion of Neighborhood 8A. However, a letter to Robert J. Hunter, Administrator, Federal Insurance Administration, Department of Housing and Urban Development, dated January 3, 1978, and signed by Richard K. Hopper, City of Foster City Public

Works Director, states that "fill operations were completed in Neighborhood 8A in mid 1977. Included with this earlier letter was a copy of a sheet from the contract plans for the fill project, which indicated that finished grades in Neighborhood 8A vary from elevation 106.0 (M.S.L. + 100') to 107.0'. These elevations are sufficiently high to prevent a flood hazard. Neighborhood 8A will be further protected from floods by a levee to be constructed around the area, in conformance with HUD requirements." Because of this response from the Public Works Director, in March of 1978, HUD modified its position in respect to Neighborhood 8A's flood classification from Zone A to Zone C (Hunter, J. Robert. Letter of March 24, 1978 to Mayor Kiyoshi Matsuo). It should be pointed out that areas of Foster City that are classified as Zone C are underdeveloped. Accordingly, for the purpose of federally insured mortgages, the developed areas of Foster City are not subject to flood hazard.

5200. The Levee System and Possible Flooding

5210. Since a major concern of flooding potential in Foster City is related to the condition of the dike system surrounding the City, this issue will now be examined. The City is surrounded by dikes approximately 11.5 miles in length. The dikes have been surveyed as to their structural integrity and required height by the Federal Housing Authority, and have consequently been approved by both the Federal Housing Authority and the Department of Housing and Urban Development, subject to routine maintenance. A very comprehensive study and a maintenance program of the dike has been worked out by the consulting firm of Daniel, Mann, Johnson, and Mendenhall. This program has been implemented by the City.

5220. It will be seen in the following paragraphs that consideration was given to the possible effect of natural hazards on the structural integrity of the levee system during its design process. Natural hazards that must be considered include the effect of earthquake related damage, and damage from excessive tides and storm related waves.

5230. Earthquake related damage to the levee system might result from the effects of a tsunami. However, considering the minor height of projected tsunamis of 6 feet reaching Foster City, damage to the levee itself must be regarded as a minor possibility. Damage to the City itself is expected to be minor in extent, being relegated to minor overtopping in and around

the levee area.

5240. Ground shaking and its associated hazards and their effect on the Foster City levee system is an issue that should be addressed. In 1969, Congressional Subcommittee Hearings were conducted with the intension of examining this very issue. The Committee was investigating how the Federal Housing Administration and the Veterans Administration processed federal mortgage loans in Foster City. Hence, the interest in Seismic Safety in Foster City. It was concluded that the levee system meets federal standards and thus Foster City residents could obtain federal mortgage loans.

5250. In construction of the levee system, tidal height analysis was conducted by the consultant firm of Wilsey, Ham, and Blair. From these studies of tidal data for the period 1940 to 1960 at the Presidio, independent probabilities and recurrence intervals were developed for the Foster City area. These theoretical findings were incorporated in the design of the levee system.

5260. In the planning of the dike system, consideration was also direct to the impact of excessive wave action, created by Northerly wind conditions of over 45 mph. During a period of 1940-1960, there was only one instance of wind conditions of over 45 mph. However, the Northern levee system incorporated the possibility of such winds in the design of that section of the levee system.

5270. Excessive storm induced tides were considered in the design of the levee system. The directional aspect of these tides were from the North and South.

5280. The effect of this intensive hazard design procedure in the levee system, coupled with the equally intensive maintenance program, has resulted in there being no history of flooding in Foster City.

6000. IMPACT OF NATURAL DISASTERS ON KEY FACILITIES IN AND AROUND THE CITY OF FOSTER CITY

6100. Highway and Freeway Network

6110. In a disaster a major element of effective emergency reaction is how the highway and freeway system can be expected to withstand a major natural disaster. The key to effective intergovernmental emergency planning is the anticipation of the effect a major disaster will have on the area's highway and freeway system. For the City of Foster City, clearly the key element of the City's reliance on outside aid is how the surrounding highway and freeway system

responds to a natural diaster.

6120. San Mateo County

6121. Highway and freeway networks are essential to the efficient provision of emergency service, as well the restoration of a sense of order after a disaster. Yet, a high level of possible seismic risk and flooding is associated with many of these facilities in San Mateo County and hence will have a direct impact on the City of Foster City.

6122. There are currently nine State freeways and highways in San Mateo County which constitute the basic network of roads: the Bayshore Freeway (Highway 101), the Junipero Serra Freeway (Interstate 280), Interstate 380, the Cabrillo Highway (Route 1), Skyline Blvd. (Route 35), El Camino Real (Route 82), Half Moon Bay Road/Younger Freeway/ San Mateo Bridge (Route 92), Woodside Road (Route 114), La Honda Road (Route 84) and Willow Road/Dumbarton Bridge (also Route 84). According to Algermissea, et al., an earthquake with a Richter magnitude of 8.3 can be expected to result in the failure of 25% of the freeway structures in San Mateo County; a Richter magnitude of 7.0 can be expected to result in the failure of 5% of these structures.

6123. Bridges are also highly vulnerable to damage, including not only those which cross the Bay (such as the San Mateo and Dumbarton bridges), but lesser bridges that surround Foster City (see the Foster City Seismic Safety Element for a detailed discussion of this issue). Caltrans advises, however, that the State is selectively strengthening its approximate 11,000 bridges by installing retaining connectors which will reduce the separation of the bridge components in an earthquake. Bridges constructed after 1971 are subject to new design criteria which utilize a seismic design force which is approximately $2\frac{1}{2}$ time greater than that used for the bridges destroyed in the 1971 San Fernando earthquake.

6124. Based on the San Mateo County Seismic Safety/ Safety Element of 1976, the following conclusions were drawn from the Geotechnical Hazards Synthesis Maps. They are of particular concern to the City of Foster City:

- a. Bayshore Freeway (Highway 101) moderate to high liquefaction potential along most of length with probable ground shaking amplification, and localized potential for flood and dam inundation.

b. Junipera Serra Freeway (Interstate 280) Runs immediately adjacent to Canada fault (a branch of San Andreas fault) from just North of Farm Hill Boulevard to Canada Road in the Redwood City/Woodside area; in close proximity to San Andreas fault between the Northerly portion of Skyline Boulevard (Route 35); crosses Serra fault near Crystal Springs Road (San Bruno); significant landslide hazard.

c. El Camino Real (Route 82) Localized potential for flooding and dam inundation; low liquefaction potential.

d. Half Moon Bay Road/Younger Freeway/San Mateo Bridge (Route 92) Crosses San Andreas fault at causeway between Crystal Springs reservoir area to West; has high landslide potential; potential for flood and dam inundation along Piloreitos Creek; dam inundation and liquefaction potential East of El Camino Real; flood and dam inundation potential East of Bayshore Freeway.

6125. Clearly, from this brief summary it would appear that there is potential for disruption of the major highway and freeway system in San Mateo County, due to the effects of an earthquake and possible flooding. While the amount of time the transportation network which would be inactive is uncertain, Foster City should include in its Disaster Preparedness Plan the possibility of geographical isolation.

6130. Foster City Situation

6131. Foster City has developed a very comprehensive highway circulation system. However, there has been to date no studies completed to determine the actual impact an earthquake or other natural disaster would have on the road network in Foster City. If, for whatever reason, there is a natural disaster, there is the possibility that the bridges in Foster City would become unuseable. In this event, Foster City would become geographically isolated. It follows, therefore, that evacuation routes would have to be found. One possible method would involve the use of the levee system. It is possible to use the southwestern section of the levee system as an evacuation point, since at that point it is relatively close to the Bayshore Freeway.

6200. Bridges

6210. A major issue facing the City is the problem of access and circulation. This problem has a common denominator - the dependence of the City on bridges

and culverts. Ingress and egress to Foster City is gained at four points: Third Avenue, 19th Avenue, Hillside Boulevard and the Hayward-San Mateo Bridge. All of these approaches involve, at some point, crossing water. In the event of a major earthquake or other natural disaster the City's bridges may be effectively damaged and/or destroyed. There is also a potential for interior disruption within the City, due to several bridges within the City. This problem is mitigated to some extent by the fact that some of the water bodies are quite shallow and can be waded across. Many of the residents of Foster City also have boats.

6220. However, it should be pointed out that the State of California (Cal Trans) examined the seismic safety for the bridges in Foster City in 1976, and found them to meet State seismic safety standards (from discussion with Richard Hopper, Public Works Director, City of Foster City, March, 1979).

6300. Utilities: Power and Gas

6310. Pacific Gas and Electric Company provides all gas and electric power to Foster City. The entire distribution system is underground. In order for a proper perspective of Foster City's reliance on Pacific Gas and Electric to be developed, one must look at how the PG&E system is utilized throughout the San Francisco-Bay Area.

6320. In terms of the relative vulnerability of electrical transmission facilities to natural disasters, the 1971 San Fernando earthquake will serve as an example: severe long-term damage was suffered by some switchyard and substation equipment, primarily at the Sylmar Converter Station. It is the policy of PG&E to make new construction as seismically resistant as possible; since the 1971 San Fernando earthquake, there have been major advances in design which tend to limit facility damage. For instance, automatic control devices are installed in distribution circuits which return the system to normal as soon after interruption as possible. The current anti-seismic design criterion utilized by PG&E on their facilities is a design lateral force of 20% of the weight of the structure.

6330. An added measure which mitigates against potential service disruption is the fact that the system is highly redundant, with several routes available to bring power into most areas. Emergency crews and supplies are available as a routine matter to repair not only worn out parts in the system, but damage from accidents as well. Despite these factors

however, it is estimated that a magnitude 8.2 earthquake could result in a 50 percent loss of service for approximately 24 hours.

6340. Gas transmission facilities in San Mateo County are only local service substations, with the main facilities being found in the East Bay region.

6350. Pipelines such as those utilized by P.G.&E. have had an excellent service record, except in cases where permanent ground distortion imposes deformation beyond the capacity of the pipe. The Bay Mud area could involve distorting forces on existing pipelines. A partial interruption in gas supplies which involve transmission lines on the baylands is a distinct possibility in the event of a major earthquake.

6360. Various types of protective equipment have been installed by P.G.&E. to minimize disruption from seismic events. Monitor regulators automatically prevent the distribution system from being over-pressured. Automatic excess-flow shutoff valves have been selectively installed as a further overload precaution. In addition, the system has been divided into zones, so that disrupted areas may be isolated without shutting down service to unaffected areas.

6370. The P.G.&E. policy in the event of a major break in its gas lines is not to close off service, but rather to continue the supply of gas at a somewhat reduced pressure. This avoids the major safety problem associated with starting service after a shutdown, which can lead to explosions and fires. In the event of complete shutdown, each separate connection must be checked for proper operation of safety devices prior to service being restored. Such an effort could create massive time delays in the restoration of service.

6380. Foster City, then, is very much dependent on the extent of a major natural disaster, on how the total P.G.&E. system reacts to any power or gas failure. If a natural disaster is localized, it is possible that Foster City will suffer little gas and power interruption. Conversely, if the natural disaster is widespread, it is possible that Foster City will suffer both a power and gas shutdown. Although the lifeline system in Foster City has been specially designed to tolerate damage from ground shaking, there still remains the definite hazard of system disruption. When coupled with the isolation potential, the need for Foster City to develop a strong self-sufficiency program becomes apparent, inasmuch as repairs to utility system might be delayed due to lack of access.

6400. Utilities (Water)

6410. In order for a proper and realistic evaluation be made of Foster City's projected success or failure to withstand the potential loss of its Hetch Hetchy water supply, consideration must be given to the capacity of the Hetch-Hetchy system itself. Clearly, the most likely disaster that might result in the disruption of Foster City's Hetch-Hetchy water supply is an earthquake. Accordingly, the following discussion is addressed to that issue.

6420. In general, large buried pipes such as those used for much of the Hetch-Hetchy distribution system have a good record in earthquakes when foundation conditions are adequate and no direct fault movement along the pipe alignment are found. However, there is little information on the performance of such pipes when crossing poor foundation material, such as Bay Mud. Experience indicates, though, that if trouble is found, it tends to occur at changes in soil properties (for example, the contact point between firm alluvium and Bay Mud). Abrupt changes are more serious than gradual changes.

6430. The number of connections to the primary supply by each municipality and the system layout has a strong influence on the reliability of individual community systems. The larger the number of connections and cross-connections in a system, the greater is the reliability of the system, providing that these connections are given a maximum amount of dispersion about the community. Following this logic, because there are only two water transmission lines from the Hetch-Hetchy system, Foster City must be viewed as being highly vulnerable to disruption of service of its Hetch-Hetchy water supply from the effects of an earthquake. Also, the water mains within the City are not designed to withstand seismic loading (it is virtually impossible to accomplish this), thus the potential exists for disruption within the City itself. The nature and extent of this disruption is unknown.

6440. Potable water for the City is provided under contract by the City of San Francisco's Water Department. This contract stipulates that San Francisco provides such water until August 24, 2011 to meet all demands as may be required by Foster City.

6450. The Estero Municipal Improvement District is the water purveyor to the City of Foster City. The District currently has two-4 million gallon storage tanks on Third Avenue near Foster City Boulevard. These tanks are for use if the 24-inch transmission main to the San Francisco Water Department line on Crystal Springs Road in San Mateo is down for any

reason. It must be pointed out, however, that it is estimated that these two water tanks, in the event of disruption of the Hetch-Hetchy water system, would supply the needs of Foster City for a 2-4 day period of reduced water use. A further factor that needs to be considered is the safety design of these water tanks, they are not designed to withstand an earthquake. However, a mitigating factor is the fact that these water tanks are constructed on pillings, which might reduce the effect of a possible earthquake.

6460. The City also now has a service system at Hillside Boulevard and Norfolk Street in San Mateo. A major (18-inch) line is being constructed along Mariner's Island and Edgewater Boulevards that will provide further looping in the District's system. This measure will serve to reduce the impact of a potential earthquake on the District's water system.

6470. The Sewer System of Foster City is also run by the Estero Municipal Improvement District. The Foster City sewer treatment plant is not designed to specifically withstand seismic hazards. However, since this structure must conform to State Building Codes, it follows that the sewer facility has met the State seismic requirement as incorporated in these codes and is therefore reasonably safe from the effects of an earthquake.

6500. Effects of Flooding

6510. Another natural hazard that might cause disruption of the Foster City sewer system is the possible effect of flooding. There are three sources of flooding that present a potential hazard to the City: (1) a rupture in the levee system, (2) the 100-year flood and (3) floods related to the effect of an earthquake.

6520. There is an extensive levee maintenance program conducted by the Estero District to mitigate the impact of natural erosion of the levee system. Also, extensive environmental conditions (high winds and tides, excessive storm conditions) have been incorporated to reduce the possibility of overtopping or rupture of the levee system. Hence, the potential of flooding from overtopping of the levee, or its rupture, is viewed as extremely remote.

6530. The 100 Year Flood is a flood that may occur once every 100 years. The Department of Housing and Urban Development (HUD) has developed flood maps, delimiting the spatial spread of flooding in Foster City. From the 1977 HUD maps, it can be determined that Foster City is subject only to minimal flooding, in areas that are undeveloped. The impact on the sewer system, therefore, is expect-

ed to be very minor.

6540. The extent of flooding caused by the occurrence of an earthquake is thought to be minor. The impact of a possible seiche within the lagoon system in Foster City is expected to be negligible. However, the impact of flooding from a tsunami may be more extensive than the seiches. A 20 foot tsunami passing through the Golden Gate is expected to be reduced to 5 feet by the time it reaches Foster City. With a maximum high tide, there is expected to be some minor overtopping to occur near the levee system. The overtopping would be of an insignificant hazard to the sewer system.

7000. REVIEW OF EMERGENCY PLANS

7100. Nature of Disaster Preparedness

7110. The primary responsibility for a program of disaster relief is that of the local jurisdiction. The State is responsible for coordinating these individual efforts, in order to provide relief if the disaster reaches regional proportions. The expected extent of damage from a major earthquake or other natural disaster may require cities bordering Foster City to function for an extended period of time using own resources. Therefore, it is imperative that each city review its disaster preparedness program to rectify the negative findings of similar programs in cities where it has been necessary to implement them.

7120. The purpose of disaster preparedness is to safeguard people in natural emergencies. Disaster preparedness in action is the coordinated response of federal, State, or local government, often working together, in an extraordinary emergency. The response calls for effective application of all available resources, as needed. The development of local capabilities for effective action in emergencies is essential to disaster preparedness.

7130. Disaster preparedness is not a separate function set apart from the normal responsibilities of government. On the contrary, disaster preparedness operations occur whenever a local government responds to any extraordinary emergency, such as a tornado, forest fire, hurricane, earthquake, flood or other natural disaster; a major explosion or other natural disaster; a major explosion or accident, or the release of radioactive materials or toxic chemicals; or an unusual peacetime emergency such as a civil disorder.

7140. Disaster preparedness is not a special unit or group of people standing by to save the day in case of a major disaster. Existing local government forces form the nucleus of preparedness, around which doctors

and hospital's staffs, the news media, industry, volunteers, and other groups organize. It is the need for Coordinated Emergency Operations involving all governmental and non-governmental groups with the capacity to help save lives or minimize damage, that distinguishes extraordinary emergencies from the emergencies that local fire and police forces, or hospitals and doctors, deal with everyday.

7150. Disaster preparedness means that a jurisdiction is prepared to respond promptly to save life and protect property if it is threatened or hit by an emergency of any type, utilizing all available resources. This requires that planning be done and preparedness actions be taken before there is an emergency. The whole concept of emergency readiness can be summed up by saying that the forces of government, and all others with emergency missions, must be able to "do the right things at the right time." This includes the ability of key executives to coordinate the operations of police forces, fire forces, ambulances, hospitals, medical personnel, radio and television stations, and all other people and units able to help citizens under conditions of extraordinary emergency.

7200. Emergency Operating Center

7210. Each community should have an Emergency Operating Center (EOC) from which officials, such as the City Manager, Police Chief and Fire Chief can exercise direction and control in extraordinary emergencies.

7220. An EOC should be located in an earthquake resistant building. It should be equipped with all maps and displays permanently in place so that key executives can understand the emergency situation as it develops. The facility should have all communications permanently in place, including those to local emergency forces (police, fire, hospitals, etc.) and the State EOC. Also, there should be a direct or indirect means of access to the Emergency Broadcasting System. The EOC should, if possible, be in regular use 24 hours a day by police or fire departments.

7230. Each community needs an emergency communications system that will permit its key executives to direct and control emergency operations. The communications, used day-to-day by police, fire, ambulance, public works and other forces provide the basis for the emergency communications system. However, additional equipment such as power generators may sometimes be needed, and should be placed or linked to the Emergency Operating Center to permit coordinated operations in an emergency.

7240. The Emergency Operating Center should be activated for any serious emergency or disaster that threatens or may threaten the citizens of the City or a major portion of the citizens of Foster City. Currently, in the event of an emergency or disaster, there are three EOC locations established in Foster City. The three EOC locations in Foster City are: (1) the Public Safety Building, (2) the Foster City Elementary School and (3) the Foster City Recreation Building. It should be pointed out, however, that the most severe type of natural disaster, an earthquake, might render these structures inoperative. They have not been specifically designed to withstand the possible effects of a major earthquake. Hence, their creditability as EOC centers must be questioned.

7250. In the event of a natural disaster or war emergency, the EOC location will be manned according to the extent required by the Director of Civil Defense. The Chief of each unit of the emergency organization, or his designated representative, and such staff assistants as are assigned will direct and coordinate emergency operations from the primary EOC. Other secondary EOC facilities as are required to accomplish essential services will be manned by personnel from appropriate emergency service agencies. Administrative support type positions for the EOC operation will be manned by personnel assigned from departments which do not have a need to remain functional during conditions of extreme emergency or disaster.

8000. SAFETY FACTORS OF SPECIAL CONCERN TO FOSTER CITY

8100. Problem of Subsidence and Differential Settlement

8110. Subsidence and differential settlement are an occurrence that should be discussed in consideration that they might be viewed as a possible safety issue. The City of Foster City is constructed in an area with potential to undergo gradual subsidence and differential settlement over a long period of time. The majority of structures have been built in areas where subsidence and differential settlement are nearly uniform and will present no problems. In certain areas, such as those once traversed by sloughs, the differential settlement will not be uniform and may slightly tilt superimposed structures.

8120. Since differential is viewed as a contingency safety factor, the soil consultants have instituted a series of design criteria to insure a minor amount of differential settlement taken place in the City. The criteria developed by the soil consultants involve the preparing of maps for new housing develop-

ments denoting areas of especially high differential settlement potential, limitation of the maximum weight of residential structures, limitation of finishing materials weight and specific design of foundations to eliminate the impact of differential settlement on structures.

8130. However, it should be pointed out that the Foster City soil engineer advises that subsidence is presently occurring and will continue as a result of fill and building loads compressing the underlying soft soils. Also, some differential settlement is occurring and will continue to occur, since the amount and rate of subsidence are influenced by variations of fill and building loads, soft soil thicknesses, the compressibility characteristics of the underlying soft soils, and the past loading history.

8140. The building loads and the weight of the portion of foundation above adjacent grade will result in several inches of additional settlement. It must be anticipated that up to several inches of differential settlement may occur within a building area over a number of years with the greatest settlement generally occurring in the central portion of the load area. Differential settlement will result from variations in subsoil as well as variation of fill and structural loads (Mekon Construction form issued in compliance with the State of California, Department of Real Estate Guidelines, September 22, 1978).

8150. The mitigating steps taken to reduce the effects of subsidence and differential settlement in Foster City have been highly successful. There has been no history of buildings collapsing or becoming uninhabitable due to subsidence or differential settlement.

8200. San Francisco International Airport

8210. San Francisco International Airport is a heavily used general aviation airport which predates the development of Foster City. In 1968, the State of California Public Utilities Commission required counties to establish a commission to regulate land use around airports. However, the establishment of such a commission by San Mateo County will have no effect on Foster City.

8220. The entire City is flown over by private and commercial aircraft and, like most urban areas, therefore, cannot be really free from the risk of aircraft accidents. The risk to developments in

in the aircraft flight paths in close proximity to San Francisco International Airport is increased. It should, however, be pointed out that San Francisco International Airport has experienced no major accidents, on the scale of the 1978 San Diego air disaster, in its history.

8230. Even though there has been no major air disaster occurring in or adjacent to San Francisco International Airport, there is no guarantee that one will never take place. Accordingly, there is need for an air disaster plan. Fortunately, San Mateo County has formulated such a plan.

8240. In the event of a major air disaster occurring in San Mateo County, the County Civil Defense Organization has prepared an emergency plan called Code 1000. It involves interjurisdictional response to a major air disaster in San Mateo County. If Foster City were to experience a major air disaster, Foster City would notify the Redwood Fire Control Center via radio and advise the Control Center of the approximate location of the air disaster. Once the initial communication has been made, the next step involves the establishment of a command post to direct operations. In the event of an air disaster striking Foster City, the Cities of Brisbane, Burlingame, Daly City, Hillsborough, Millbrae, San Bruno and San Carlos will send one engine each to the City; the Cities of Belmont, Menlo Park and Redwood City will send two engines each to the City; the California Division of Forestry will send two engines. In addition to these, the City of Foster City currently has three engines and one truck call of which have pumping capabilities available in the event of an air disaster.

8300. Hazardous Materials

8310. Considerable radiological materials are being used or transported within San Mateo County. An accident could result in spillage or other loss of control, creating a hazard. Nuclear radiation cannot be seen or felt. It can only be detected to prevent excessive exposure or contamination by the spilled material.

8320. For the purpose of Foster City, there are radioactive materials used by commercial businesses within the City. However, the amount of radioactive material used in Foster City is of a minor nature and presents no hazard to the citizens of Foster City. Highway 92 is used to transport radioactive materials. In the event of a radiological accident, there are specific procedures that will be taken to reduce the possible harm of radioactivity to the citizens of Foster City. It is important, therefore,

to briefly examine the procedure for a radiological incident.

8330. Radiological incidents are occurrences which result in the loss of control of radioactive material and which create a hazard to life, health or property.

8340. Notification of the occurrence of any such incident will be forwarded by the most expeditious means available to the County Emergency Service Office. Until the arrival of the State Department of Health, Radiologic Health Section; Energy Research and Development Administration (ERDA), formerly the Atomic Energy Commission; or military Emergency Radiological Assistance Teams (ERAT), coordination of agencies involved is the responsibility of the County Emergency Service Office.

8350. To assist in the efficient handling of an incident involving a radioactive source with the attendant spillage or release of radiological material, a detailed reporting system and on-the-scene emergency actions (which provide protection against radiation exposure) have been developed.

8360. Another potential hazard to Foster City is the use of hazardous chemicals. In some commercial businesses in Foster City, chemical acids are used in the manufacturing of various products. The use of these chemical acids present no health hazard to the citizens of Foster City. It should be pointed out in this document that there are no chemicals manufactured in the City.

8370. However, even though hazardous chemicals are not manufactured in Foster City, they are transported on Highway 92. There is always the possibility of an accident resulting in the rupture of a container truck carrying hazardous materials. If such an event occurs, it would be the responsibility of the Foster City Fire Department, along with the appropriate environmental protection agencies, to institute decontamination (wash-down) procedures of these hazardous materials. Decontamination procedures involve the wash-down of gasoline, oils, and other hazardous materials.

8500. Warning System and Impact on Foster City

8510. The warning system is the means for relaying

notice of impending or actual attack from the Federal Government to the public. Regardless of the effectiveness of the warning system, it can do no more than inform. It is the response to warning by the total emergency organization and the public which is important. Appropriate response and effective use of the warning information may be limited by the amount of time available.

8520. Warning actions are characterized by high priority for a short period of time, the use of mass media systems for passing warning to the public, a small number of workers to man the system, a need for fast activation of the system on short notice and readiness to repeat all actions in the event of successive alerts or attacks.

8530. The National Warning System (NAWAS) feeds warning information to the State Warning Point. (The statewide Warning Points also hears the NAWAS information but do not take action from it.) After the State Warning Point transmits the warning condition, the Warning Points activate the Bell Lights warning system to inform the public by means of outdoor warning devices, mobile loudspeakers and other devices.

8540. Upon activation by the President, the Emergency Broadcast System will provide warning information to the public.

8560. Warning information is received at the San Mateo County Communications Center and in the City of Foster City's Department of Public Safety via the Bell and Light System. Alternate means of receipt, within the County, are via the State Department of Justice teletypewriter Network and Public Safety radio systems. System has 24 hour/day manning.

8570. The general public receives warning by means of a siren which is located to provide coverage for an estimated 90 percent of the peak nighttime population. Remainder of the population will be notified by other available means. In addition, the Emergency Broadcast System is expected to provide coverage for a large part of the population.

8580. Notice of warning is also broadcast from the various county and city communication centers to special facilities (schools, hospitals, fire stations, utility stations, etc.). Key worker of emergency organizations are alerted by means of monitor receivers or public warning device.

8581. Types of Warning

a. Attack Warning:

A civil defense warning that an actual attack against this county has been detected.

b. Fallout Warning:

A warning of radiation hazards from nuclear detonation.

c. Natural Disaster Warning: (NADARN)

A warning concerning severe wind storm, floods, fires and other dangers such as seismic sea (tidal) waves.

8582. Warning Signals

a. Two standard warning signals have been established.

(1) The Attack Warning Signal:

Three to five minute wavering tone on sirens, or short blast on horns or whistles, repeated as deemed necessary.

(2) The Attention or Alert Signal:

Three to five minute steady tone on sirens, horns or whistles, repeated as often as deemed necessary. This signal may be used at the option and on the authority of local governments to provide warning of an impending peactime emergency.

8600. Emergency Broadcast System (EBS)

8610. General

8611. The State has been segmented into "EBS Operational Areas" for the purpose of disseminating emergency information.

8612. Each "EBS Operational Area" encompasses one or more county areas. Selected "EBS" stations have been provided with fall-out-protected facilities. Other unprotected but authorized EBS stations will continue to operate as conditions permit.

8613. All authorized stations in each "EBS Operational Area" will broadcast a common program. A "program entry point" has been established for each EBS area. Civil defense authorities for each jurisdiction will prepare emergency information and action instructions.

8620. Operational Considerations

8621. Authorized stations will continue to broadcast on regular assigned frequencies during a War Emergency, but the use of call letter identification will cease with the activation of EBS. Instead, stations will broadcast area identification. Listeners will be advised to monitor those stations which serve the area in which they are located, since EBS announcements may vary according to area served.

8630. Facilities

8631. Program Entry Point for this area is the Alameda County EOC office in Oakland. Emergency information will be routed to the Program Entry Point via the San Mateo Operational Area Civil Defense and Disaster Office.

8632. EBS stations serving this area are:

<u>STATION</u>	<u>FREQUENCY</u>
KNBR*	680
KCBS	740
KGO	810
KNEW	910

* indicates protected station

8700. San Mateo County Emergency Plan

8710. Civil government, augmented and reinforced during an emergency, conducts emergency operations, provides mutual aid between local governments, including State and Federal support, and control all critical and essential resources required for disaster response. The local civil government also gives direct support to military forces engaged in retaliatory or defensive operations. In accordance with current California legislation and emergency planning, the San Mateo Operational Area has been established to assist in emergency response within the County. The area coordinator and such staff as required will coordinate interjurisdictional actions of the County and the various cities. The Operational Area organization serves as an intermediate link in the lines of communication and coordination between local jurisdictions and the state emergency organizations and the state emergency organization during a State of War Emergency, and may be used during a State of Emergency or declared Local Emergency.

During an emergency, non-essential private and governmental activities will be reduced or stopped, depending upon emergency conditions. This operations plan identified foreseeable tasks, organizational requirements, resource requirements and procedures for the conduct of emergency operations.

8720. The County emergency organization may conduct emergency operations inside the limits of Foster City, based on mutual agreement pact with the County.

8800. The City of Foster City and its Civil Defense Disaster Plan

8810. The City of Foster City has a series of a fully developed and adopted emergency plans under the general heading of its Civil Defense Disaster Plan. Essentially, the City of Foster City has formulated a series of emergency plans dealing with virtually any type of natural or man induced emergencies.

8820. One emergency procedure that has not been considered in the Foster City Civil Defense Disaster Plan involves the potential evacuation of the City. The reason there is cause for concern is the possible isolation that the City might experience in the event of a natural disaster. This isolation would occur only if all the bridges out of Foster City were unusable for whatever reason.

8830. However, the Fire and Police Departments do have plans for inner City evacuation. This type of evacuation would consist of the removal of residents of Foster City from an area that has been stricken by a disaster to disaster relief stations established at different points throughout the City.

8840. If the bridges are unusable for whatever reason, there are two possible evacuation points for the City: one is the already discussed southwest corner of the levee system and the second is the San Mateo/Hayward Bridge. There are no formal plans, however, for the use of these points. These two possible evacuation points, therefore, can be viewed as only recommendations.

9000. PUBLIC SAFETY

9100. Police Department

9110. The Foster City Police Department currently has one police station at 1040 East Hillsdale Boule-

yard. The Police Department at the moment has 23 full-time officers. There are three shifts: a day shift, a night shift and a graveyard shift. Currently, based on population of 26,000, there are .88 police officers per 1,000 of population in Foster City.

9120. Owing to the nature of Foster City's street pattern, the Police Department's response time is generally quite good, in the range of that of the Foster City Fire Department, between 3 - 5 minutes (response time depends also on the nature of the crime report, if for example a crime is in progress the 3 - 5 minute response time is accurate. However, if a crime report is of a low priority nature, the response time will be somewhat longer than the 3 - 5 minute interval). During day light hours, there is little difficulty in locating house numbers. However, during the night hours, a problem arises in finding exact house numbers because of failure to have clearly visible house numbers.

9130. Presently, the major crime problem areas are vandalism and burglary. Both of these crime classifications are on the increase. Crime in Foster City has increased since its inception as a City in 1971, but the increase can be traced to the increase of Foster City population from 1971-1979. (1971 population was 11,682, in 1979 it is nearing 26,000).

9200. Ambulance Service

9210. There is currently one ambulance company serving Foster City. It is Medevac, a private company working under contract to San Mateo County. It is licensed and regulated by the San Mateo County Administration and is dispatched by the County Fire Department.

9220. The ambulances are equipped in accordance with requirements of the San Mateo County and City of Foster City Ambulance Ordinances. Ambulance headquarters are at the City of San Mateo Police Department headquarters in San Mateo.

9230. Response time from the ambulance headquarters to Foster City is between 6 to 7 minutes. When there is a medical emergency, the Foster City Fire Department also reacts to the medical emergency, reaching the emergency scene within a 3 to 5 minute period. The Medevac Ambulance Service also has paramedic capabilities.

RECOMMENDATIONS AND PROPOSED POLICY

1. RECOMMENDATION: Knowledge of emergency preparedness should be required throughout the City's structure.

PROPOSED POLICY: This should be accomplished in a way which ensures comprehensive and correct knowledge, perhaps through short training sessions for new staff and the administration of periodic tests.

2. RECOMMENDATION: The parking of trucks carrying flammable and other hazardous substances on city streets other than for purposes of loading or delivery should be prohibited.

PROPOSED POLICY: This appears to be a justified charge toward improving public safety vs. the convenience of truck drivers and some business establishments.

3. RECOMMENDATION: The Planning Department should feature in its news release a summary of the Safety Element, as well as suggestions as to how the general public could react in the event of a disaster.

PROPOSED POLICY: There are several advantages to this recommendation, including public information and education as well as obtaining popular reactions and feedback. All of this should be at minimum cost to the City.

4. RECOMMENDATION: Foster City should consider the adoption of an emergency evacuation plan.

PROPOSED POLICY: Even though there is no formal plan for the evacuation of the City, the two recommendations made in the body of this report should be fully explored by the responsible officials.

5. RECOMMENDATION: Foster City should study the possibility of the addition of a third water tank to mitigate the possible effects of disruption of Hetch-Hetchy water.

PROPOSED POLICY: In the event of disruption of the Hetch-Hetchy water system, Foster City would have only 2-4 days of water. A third water tank might increase that figure to 4-6 days, which could be a critical factor.

6. RECOMMENDATION: If possible, it would be desirable to request that the San Francisco International Airport alter the flight paths of its aircraft to the middle of San Francisco Bay.

PROPOSED POLICY: Such a step might mitigate the possible effect of an air disaster occurring near Foster City.

7. RECOMMENDATION: Foster City should review its ability to sustain itself for a limited period of time.

PROPOSED POLICY: Such an analysis would result in Foster City being able to respond to the effects of an temporary geographical isolation.

BIBLIOGRAPHY

- Algermissen, S. T. Seismic Risk Studies in the United States;
Fourth World on Earthquake Engineering, U.S. Department of
Commerce Coast and Geodetic Survey, January 17, 1969.
- City of Foster City, Civil Defense Disaster Plan, March 3, 1978.
- City of Foster City Planning Department, Seismic Safety Element:
An Element of the General Plan, 1979. .
- Code 1000, Procedure for Local Fire Departments for San Francisco
International Airport Air Disaster, prepared by the County of
San Mateo Fire Department, 1974.
- Dames and Moore, Draft San Mateo County Seismic Safety/Safety
Element, 1975.
- Dames and Moore, San Mateo County Seismic Safety/Safety Element,
1976.
- Dukleth, G. W. letter of August 4, 1974 to James F. Halcomb,
Superintendent, Hillsborough City School District, Hillsborough,
California.
- Limerinas, J. T. and others 1973 Map of Flood Prone Areas in the
San Francisco Bay Area.
- Hopper, Richard Director of Public Works, City of Foster City,
letter of January 3, 1978 to Robert J. Hunter, Administrator,
Federal Insurance Administrator, Department of Housing and
Urban Development.
- McKeon Construction Co. form issued in compliance with the State of
California, Department of Real Estate guidelines, September
29, 1978.
- Nichols, C. L. of the Consultanting firm of Dames and Moore,
letter of September 22, 1978 to Milton Nicholas, Planning
Director, City of Foster City.
- United States Congressional Hearings Before a Subcommittee of the
Committee on Government Operations, House of Representatives,
92 d Cong., 1st sess., 1969.
- United States Department of Housing and Urban Development,
FIA Flood Hazard Boundary Map, June 14, 1974.
- United States Department of Housing and Urban Development,
National Flood Insurance Map, January 1, 1977
- Wilsey, Ham & Blair, National Marine Consultant Levee Height
Design Analysis, Brewer Island, California, January, 1962.



C124900900